

REMARKS

In the Office Action, the Examiner rejected claims 1-20 for failing to comply with the written description requirement. The Examiner also raised a number of indefiniteness rejections against various claims. Each rejection is addressed separately below. In view of the amendments noted above and the remarks below, the applicants respectfully request reconsideration of the merits of this patent application.

No extension of time is believed to be necessary and no fee is believed to be due in connection with this response. However, if any extension of time is required in this or any subsequent response, please consider this to be a petition for the appropriate extension and a request to charge the extension fee to the Deposit Account No. 17-0055.

Written Description Rejection Against Claims 1-20 Under 35 U.S.C. § 112, First Paragraph

The Examiner rejected claims 1-20 for failing to comply with the written description requirement alleging that the specification does not describe the genus of Tn5 transposase mutants.

In response, claims 1 and 12 are amended to clarify that the Tn5 transposase mutants recited in the claims are defined by the wild-type Tn5 transposase SEQ ID NO:2 into which mutations at amino acid positions 54, 242, and 372 are introduced. Along with the functional definition that the transposase mutants must have greater avidity than wild-type Tn5 transposase for at least one of the Tn5 outside end sequence of SEQ ID NO:3 and the modified Tn5 outside end sequence of SEQ ID NO:5, the applicants respectfully submit that claims 1-20 as amended satisfy the written description requirement.

It is well understood in the art that a Tn5 transposase mutant refers to wild-type Tn5 transposase into which one or more mutations are introduced. A skilled artisan can readily recognize such a mutant by its high homology in amino acid sequence to the wild-type Tn5 transposase. For example, U.S. patents 5925545, 5965443, and 6406896 (all are of record) described Tn5 transposase mutants that carried one or more mutations at amino acid positions 54, 56, 58, 110, 345, and 372 relative to the wild-type Tn5 transposase. The Tn5 transposase mutant genus recited in the claims has been described by its structure, i.e. SEQ ID NO:2 having mutations at amino acid positions 54, 242, and 372, and by its function, i.e. having greater avidity than wild-type Tn5 transposase for at least one of the Tn5 outside end sequence of SEQ ID NO:3 and the modified Tn5 outside end sequence of SEQ ID NO:5. A skilled artisan can certainly appreciate that additional mutations can be introduced at other positions of SEQ ID NO:2 without affecting the above function. For example, the

specification of the present application provides that an additional mutation at amino acid position 56 can be introduced in this regard (page 6, paragraph [0023]). Whether a Tn5 transposase mutant containing one or more mutations at other amino acid positions of SEQ ID NO:2 retains the avidity function and thus falls within the scope of the genus can be easily determined by a skilled artisan through routine experimentation as described in examples 1 and 2 of the application. Therefore, a skilled artisan would understand that the applicants possessed the Tn5 transposase mutant genus recited in claims 1 and 12 and that the written description requirement for claims 1-20, as amended, is satisfied.

Indefiniteness Rejection Against Claims 1, 12, and 16-19 under 35 U.S.C. § 112, Second Paragraph

The Examiner rejected claims 1, 12, and 16-19 for being indefinite, alleging that the term “outside end sequence” recited in the claims is vague. The applicants respectfully note that “outside end sequence” is an art-recognized term for one of two imperfect inverted repeats located at the two ends of an insertion element such as IS50. The other repeat is called “inside end sequence.” To demonstrate that the term is well understood by a skilled artisan, the applicants attach, as examples, three of the many papers published with well respected scientific journals in which the term is used: (1) Jilk et al., *J. Bact.* 178:1671-1679, 1996 (see e.g., page 1671, left column, lines 4-6 from the bottom and Fig. 1); (2) Goryshin et al., *PNAS* 91:10834-10838, 1994 (see e.g., page 10834, right column, lines 1 and 2 and Fig. 1); and (3) Sasakawa et al., *PNAS* 80:7293-7297, 1983 (see e.g., page 7293, left column, lines 7 and 8 from the bottom and Fig. 1). These three papers are now of the record via the accompanying supplemental IDS. As the term is well understood by a skilled artisan, claims 1, 12, and 16-19 are definite under 35 U.S.C. § 112, second paragraph.

Indefiniteness Rejection Against Claim 18 under 35 U.S.C. § 112, Second Paragraph

The Examiner rejected claim 18 for being indefinite, alleging that the term “low concentration” is vague as no point of comparison is provided for determining what concentration is considered low. Without agreeing with the Examiner, the term “low concentration” in claim 18 is replaced with “a concentration suitable for generating intramolecular transposition” to facilitate prosecution. This amendment finds support at paragraph [0034], lines 11-18. The rejection is believed to have been overcome by the amendment.

Indefiniteness Rejection Against Claims 1-20 under 35 U.S.C. § 112, Second Paragraph

The Examiner rejected claims 1-20 for being indefinite, alleging that the claims do not provide a reference sequence by SEQ ID NO based on which the recited specific mutation positions can be determined. Independent claims 1 and 12 and dependent claim 10 are amended to recite SEQ ID NO:2 in this regard. The rejection is believed overcome by the amendment.

Indefiniteness Rejection Against Claim 20 under 35 U.S.C. § 112, Second Paragraph

The Examiner rejected claim 20 for being indefinite, alleging that the term “quasi-random” recited in the claim is vague. Without agreeing with the Examiner, the term is deleted from the claim to facilitate prosecution.

Conclusion

Having responded to each issue raised by the Examiner, pending claims 1-20 as amended are believed to be in condition for allowance. A Notice of Allowance is respectfully requested.

Respectfully submitted,



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